J. M. SCHOONMAKER, JR.

MOTOR FIRE ENGINE.

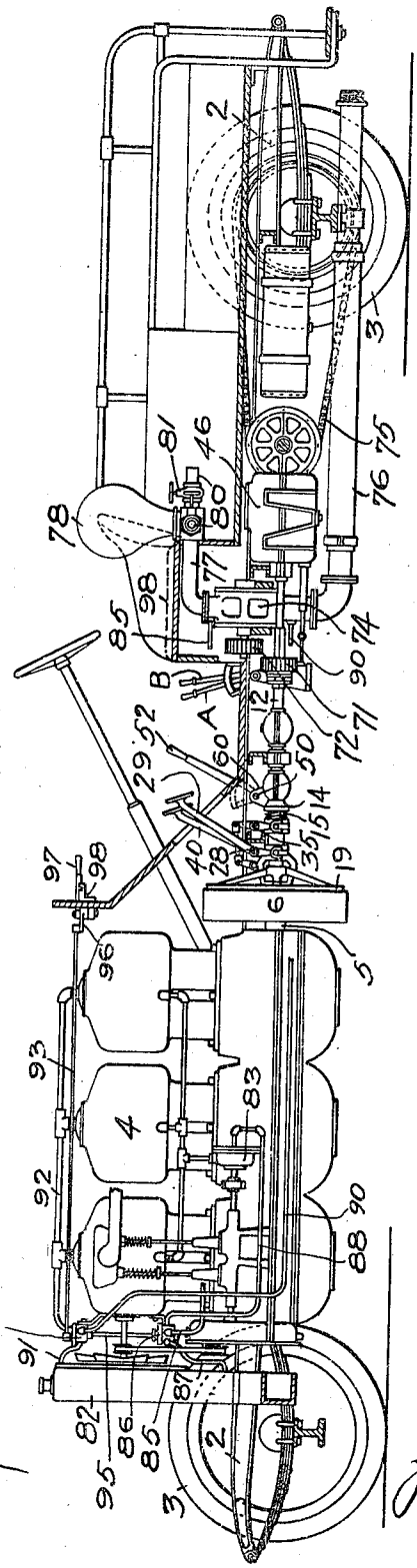
APPLICATION FILED FEB. 24, 1909.

1,013,622.

Patented Jan. 2, 1912.

4 SHEETS—SHEET 1.

FIG. 1



WITNESSES.

J. R. Keller

J. F. Hill.

INVENTOR,

James M. Schoonmaker Jr

By Kay & Sutton

Alleys

J. M. SCHOONMAKER, JR.

MOTOR FIRE ENGINE.

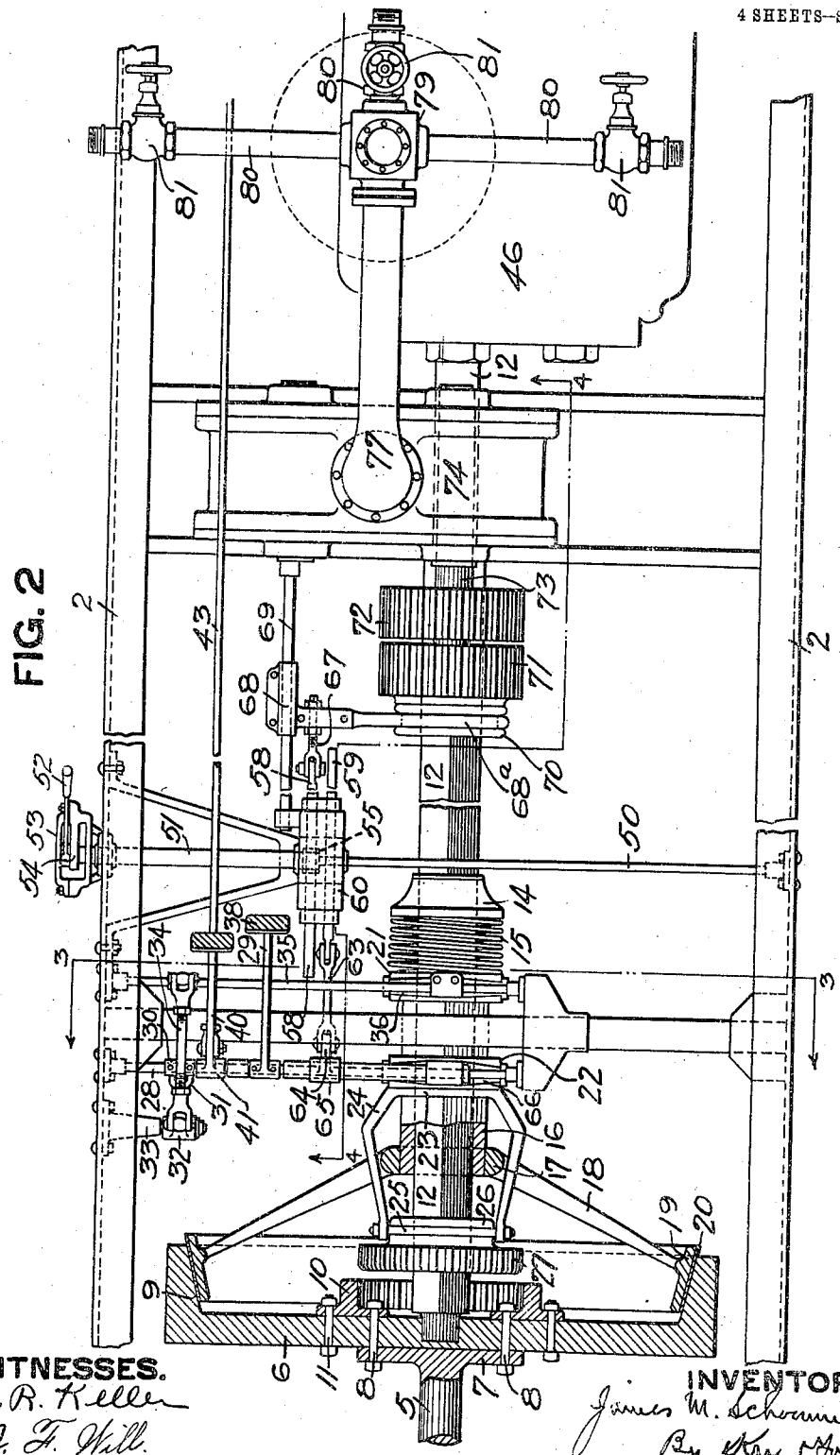
APPLICATION FILED FEB. 24, 1909.

1,013,622.

Patented Jan. 2, 1912.

4 SHEETS—SHEET 2.

FIG. 2



WITNESSES.

J. R. Keller

J. F. Hill.

INVENTOR.

James M. Schoonmaker Jr

By Kay Mattson

attys

J. M. SCHOONMAKER, JR.

MOTOR FIRE ENGINE.

APPLICATION FILED FEB. 24, 1909.

1,013,622.

Patented Jan. 2, 1912.

4 SHEETS—SHEET 3.

FIG. 3

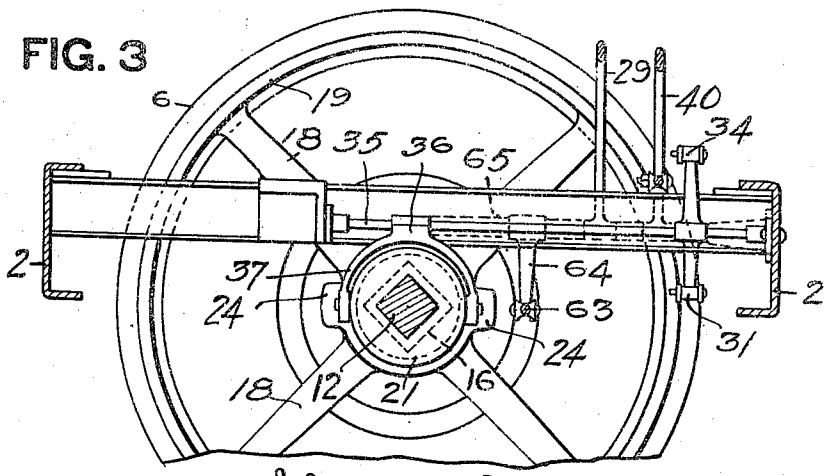


FIG. 4

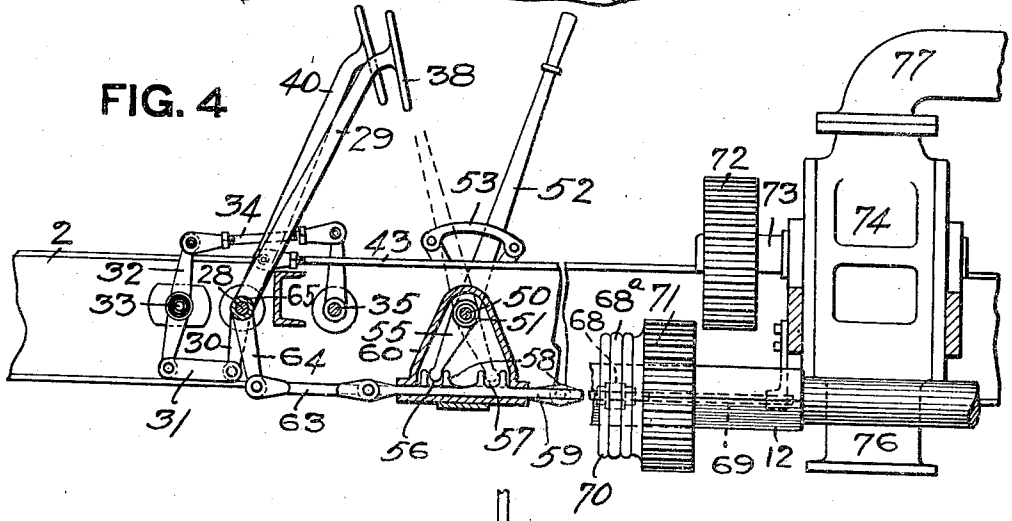


FIG. 5

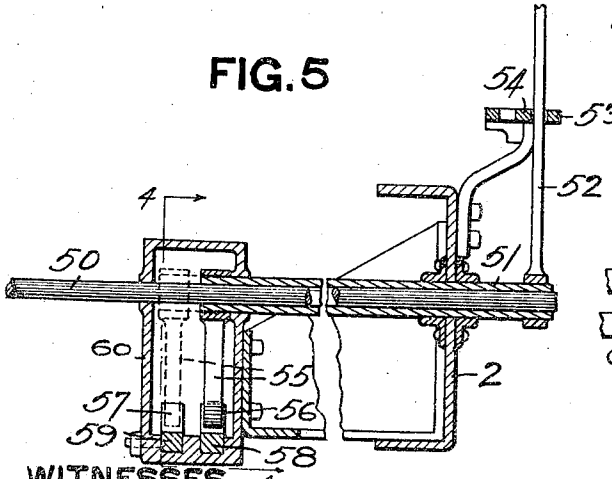
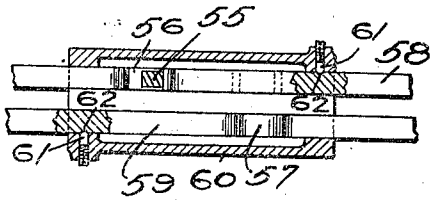


FIG. 6



WITNESSES.

J. R. Keller

J. F. Hill.

INVENTOR.

James M. Schoonmaker Jr

By Kay Mother

Atty

J. M. SCHOONMAKER, JR.

MOTOR FIRE ENGINE.

APPLICATION FILED FEB. 24, 1909.

1,013,622.

Patented Jan. 2, 1912.

4 SHEETS—SHEET 4.

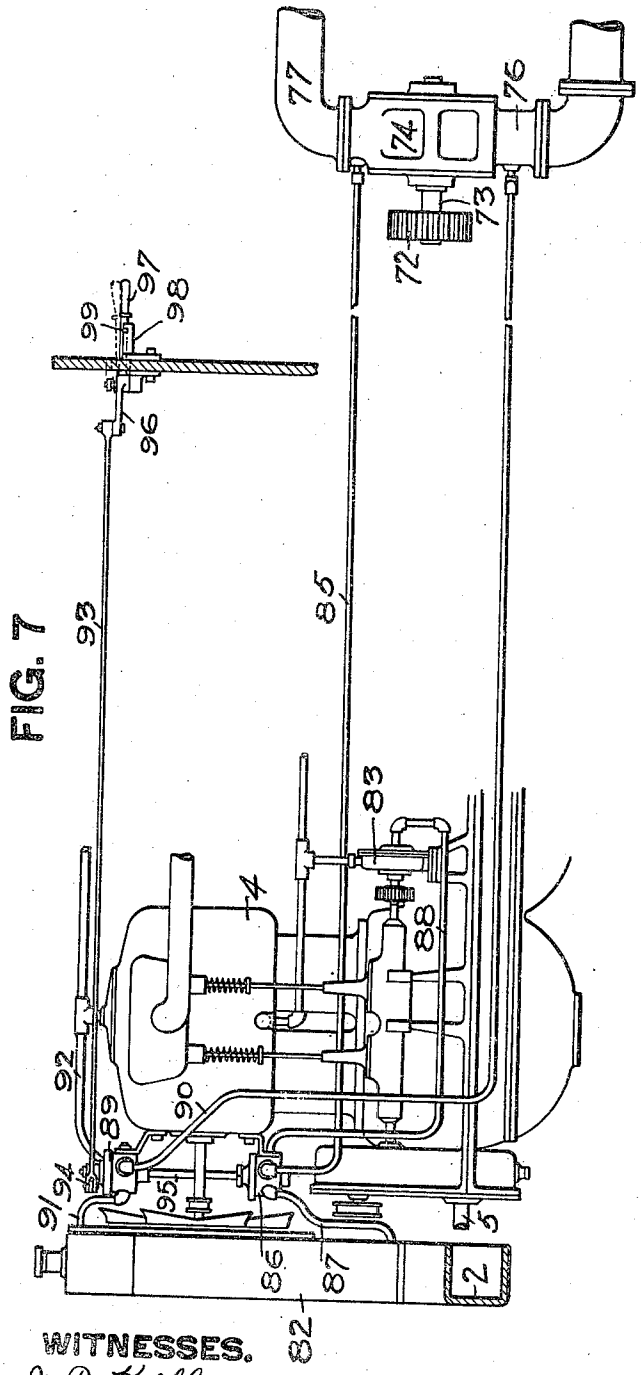


FIG. 7

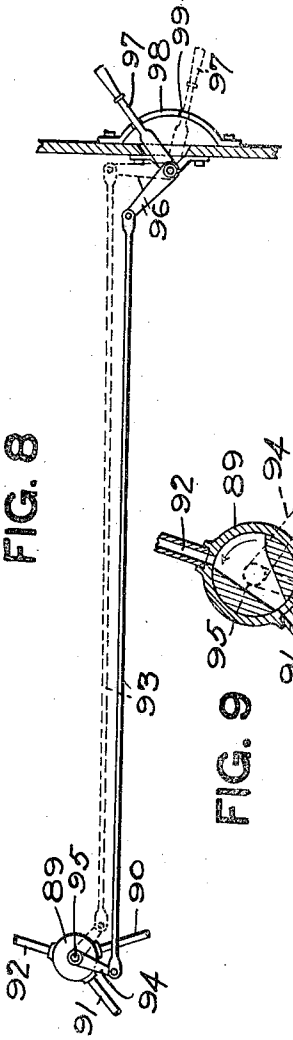


FIG. 8

FIG. 9

WITNESSES.

J. R. Keller

J. F. Hill.

INVENTOR.

James M. Schoonmaker Jr

By Kay & Gotten

Attys

UNITED STATES PATENT OFFICE.

JAMES M. SCHOONMAKER, JR., OF PITTSBURGH, PENNSYLVANIA.

MOTOR FIRE-ENGINE.

1,013,622. Specification of Letters Patent. Patented Jan. 2, 1912.

Application filed February 24, 1909. Serial No. 479,764.

To all whom it may concern:

Be it known that I, JAMES M. SCHOONMAKER, Jr., a resident of Pittsburgh, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Motor Fire-Engines; and I do hereby declare the following to be a full, clear, and exact description thereof.

My invention relates to an automobile fire engine so constructed as to travel and pump from power derived from the same power plant.

The object of the invention is to provide a fire engine of this character provided with the clutch mechanism by means of which the car may be controlled with perfect ease when traveling to or from a fire and at the same time absolutely positive so that it cannot slip when thrown into position to do the pumping.

A further object of my invention is to improve such fire engines in other respects, all of which embodies, generally stated, the construction hereinafter set forth and claimed.

Referring to the drawings Figure 1 is a side elevation of my improved fire engine partly in section; Fig. 2 is an enlarged plan view of a portion of the fire engine showing the clutch mechanism and the manner of operating the same; Fig. 3 is a cross section on the line 3—3 Fig. 2; Fig. 4 is a section taken on the line 4—4 Fig. 2; Figs. 5 and 6 are enlarged details of the slides; Fig. 7 is an enlarged side view of a portion of the machine showing the manner of controlling the circulation through the pumps and radiator; and Figs. 8 and 9 are details of the valve mechanism.

While I have illustrated my invention in connection with an automobile driven by a gasolene engine, I do not desire to limit myself in any way to the kind of motor or power employed for driving the car and working the pump.

The numeral 2 designates the chassis of a suitable automobile running on the wheels 3. Located at the forward end of the chassis is the gasolene engine 4 which may be of any suitable construction provided with proper valves and other parts which I have not deemed it necessary to illustrate in detail, as the engine forms no part of my invention. The engine shaft 5 is provided with the fly-wheel 6, the shaft being secured to said fly-wheel by means of the integral flange 7 bolted to said fly-wheel by means of the bolts 8. The fly-wheel 6 is provided with the annular cone face 9 and with the internal gear 10 which is bolted to said fly-wheel 6 by means of the bolts 8 and 11. The main clutch shaft 12 is square or polygonal in cross section and its extreme outer end portion is round to engage a bearing or seat in the fly-wheel 6 so that said fly-wheel may rotate freely on said shaft 12 when not engaged by the clutch mechanism. The square portion of the shaft 12 extends to the flange 14 which is preferably formed integral with the shaft 12 and said flange forms the backing or abutment for the clutch spring 15 which is interposed between the said flange 14 and the square sleeve or shaft 16. At the forward end of the shaft 16 is the collar 17 from which lead the spokes 18 of the cone 19. The rim or periphery of the cone 19 is furnished with a facing 20 of leather, or other suitable material to give the proper frictional contact. The cone 19 is given the same inclination as the conical face 9 of the fly-wheel 6 so as to form a snug and close fit therewith. At the rear end of the shaft 16 is the grooved annulus 21 preferably formed integral with the shaft 16 and provided with ball thrust bearings.

Slidable on the square shaft 16 is the grooved annulus 22. Bolted or otherwise secured to the annulus 22 is the split ring 23 and extending forwardly from said split ring are the arms 24 connected to the split ring 25 which encircles the groove in the collar 26 which is adapted to slide on the shaft 12. The collar 26 forms part of the spur gear 27, which is likewise slidable on the shaft 12 and is adapted to be thrown into engagement with the internal gear 10 on the fly-wheel 6. The spokes 18 of the cone 19 are arranged at such an angle with reference to the rim of the cone to provide room for the movement of the spur gear 27 while the arms 24 pass between said spokes, as clearly illustrated. By this construction the spring 15 normally holds the cone 19 in engagement with the fly wheel 6, while, by sliding the annulus 22, the spur gear 27 may be independently operated so as to be thrown into and out of engagement with the internal gear 10 on the fly-wheel 6.

I will now describe the mechanism by means of which the movement of the above parts is accomplished: A shaft 28 is journaled in the frame and secured to said shaft

is the foot-lever 29. Secured to said shaft 28 and extending down therefrom is the arm 30 which is connected by the link 31 to the arm 32 pivoted to the stud 33 on the frame. The upper end of the arm 32 is connected by the turn-buckle 34 with the shaft 35 journaled in the frame. An arm 36 is secured to the shaft 35 and said arm is provided with the yoke 37 which engages the groove of the annulus 21. It will be apparent that when the operator applies his foot to the pedal 38 of the lever 29 and applies pressure the shaft 35 through the intermediate parts will be moved so as to operate the yoke 37 and move the annulus 21 secured to the shaft 16 whereby the cone 19 will be withdrawn from engagement with the conical face of the fly wheel 6. The second foot lever 40 engages the shaft 28 by means of the collar 41, said collar being loosely mounted on said shaft. This lever 40 is the foot brake lever and a rod 43 is connected to said lever above the pivotal point, said rod extending back to operate a brake band of the braking mechanism which it has not been deemed necessary to illustrate as it forms no part of the present invention.

The transmission box 46 contains the gears of the ordinary construction and as the transmission mechanism forms no part of my invention I have not deemed it necessary to illustrate the same in detail. A hand lever A is provided which operates the transmission mechanism and by means of this lever A the transmission may be brought to neutral position. This lever also controls the forward and reverse speeds of the car by the different engagement of gears in the transmission box. The hand lever B is for the emergency brake which has not been illustrated.

To provide for the throwing of the spur gear 27 into engagement with the internal gear 10 on the fly-wheel I employ the following mechanism: A shaft 50 is supported by the frame and on said shaft is the hollow sleeve or shaft 51. Connected to the outer end of the shaft 51 is the lever 52 which is adapted to move in the quadrant 53. This quadrant 53 is divided by the partition 54 so as to make a U-shaped slot within which the lever 52 plays. Connected to the inner end of the hollow shaft 51 is the downwardly extending arm 55 which engages a seat 56 or 57 in the slides 58 and 59. These slides move in suitable guides in the bottom of the box 60 which is supported by the frame. These slides 58 and 59 are automatically locked in position by means of the spring latches 61 which have the tapering inner ends adapted to engage seats 62 formed in said slides. The said slides may be released by applying sufficient force to move the latches 61 from the seat 62, but said latches will hold the slides from moving under the jolting or jarring of the car. One of the slides 59 is connected to the arm 63, the other end of said arm being connected to the arm 64 secured to the sleeve 65 on the shaft 28. A yoke 66 on the sleeve 65 engages the annulus 22 and is adapted to move said annulus so as to move the spur gear 27 into and out of engagement with the internal gear 10. The other slide 58 is connected to the arm 67 which is in turn connected to the sliding arm 68 mounted on the rod 69. This sliding rod 68 has the yoke 68^a which engages the annulus 70, forming part of the gear 71 on the main shaft 12. This gear 71 is adapted to be drawn into engagement with the gear 72 on the shaft 73 of the pump 74. This pump 74 may be of any suitable construction, that shown being an ordinary gear pump although I have not deemed it necessary to illustrate the internal construction thereof.

The shaft 12 extends back into the transmission case in the ordinary manner and power to drive the rear wheels 3 of the car is transmitted to the rear axle by means of the chain 75 in the ordinary manner.

The inlet pipe 76 leading to the pump enters said pump from below and the outlet pipe 77 is connected up to the air chamber 78. The discharge pipe 79 is provided with the outlets 80 to which the hose may be connected, said outlets being provided with suitable valves 81.

To provide for the cooling of the engine when the automobile is running, I provide the ordinary pipe connections and radiator 82, the circulation through the water jackets of the engines being effected by means of the small pump 83. This arrangement is up to this point the same as in all automobiles. It will be found, however, that where the device is to be used as a stationary engine when pumping at a fire, the circulation obtained in the above manner will not be sufficient and I provide means for obtaining circulation from the main pump I accordingly provide a pipe 85 which is connected to the pump outlet and said pipe extends forward and is connected up to a two-way valve 86. This two-way valve may be of ordinary construction, as shown in Fig. 9. A pipe 87 leads from said valve to one end of the radiator and a pipe 88 leads from said valve to the pump 83. A second valve 89 of the same type is employed and a pipe 90 leading from the suction end of the pump is connected to said valve 89 while a pipe 91 leads from the engines to said valve. In order to operate valves 86 and 89 from a common point and by a common device I employ the rod 93 which is connected up to the arm 94 connected to the rod 95 which is adapted to operate both valves at the same time. The inner end of the rod 93 is con-

nected to the crank arm 96 which is operated by the handle 97 located within convenient reach of the operator and this handle 97 is adapted to move across the quadrant 98 and fit into notches 99 therein to hold the valves in the desired positions.

From the above it will be apparent that when the car is in motion the water will be admitted to the water jackets in the ordinary manner and the valves 86 and 89 will be in such position as to shut off the pipes 85 and 90, the circulation being through the engine pipes 92 and 91 to the radiator, thence by pipes 87 and 88 through the pump, whereby the circulation is maintained. When the engine, however, is in operation at the fire the operator by means of the handle 97 throws the valves 86 and 89 in such position that the pipes 87 and 91 to the radiator are closed and the pipes 85 and 90 opened. In this manner the water is admitted from the main pump 74 and passes through the valve 86 and by the pipe 88, goes through the pump 83 and through the engine and then by means of the pipe 92 through the valve 89 and pipe 90 back to the suction end of the main pump. In this manner a positive and rapid circulation is obtained through the engine to prevent the heating up of the parts.

I provide at the rear of the engine seats for the necessary firemen and provision may be made for carrying reels of hose, babcocks, or other paraphernalia. A seat 98 is provided for the driver of the car and all the hand and foot levers are in convenient position to be reached by the driver so that he has all the parts under complete control and ready of access.

When the machine is traveling to the fire the power from the engine will be transmitted through the crank shaft 5, fly-wheel and cone to the shaft 12 and thence to the transmission gear in the ordinary manner. Upon arrival at the fire, the operator with his foot on the foot lever 29 throws the cone 19 out of engagement with the fly-wheel which cuts off the power to the transmission and brings the car to a standstill while the engine continues to run. By the hand lever A he brings the transmission gears to neutral position. The connections having been made meantime with the fire hydrant the power is applied to operate the pump and this is accomplished by means of the lever 52. This lever is thrown forward which will act to move the slide 58 in such position as to move the arm 67 and through it the gear wheel 71 into engagement with the gear wheel 72. Just as soon as the operator removes his foot from the foot lever 29 the spring 15 forces the cone into engagement with the fly-wheel 6 and power is transmitted to the shaft 12 and the gear wheel 71 being in engagement with the gear wheel 72 power is transmitted to the pump 74. In order to prevent any possible chance of the slipping of the cone 19 in the fly-wheel when the load is increased by the operation of the pump I have provided the auxiliary drive which is obtained by throwing the spur pinion into engagement with the internal gear 10. This is accomplished by the operation of the lever 52. As stated above, the lever was moved forward to throw the gear 71 into engagement with the gear 72. The lever is now moved across the partition 54 and through the inner branch of the U-shaped slot, whereupon engagement is made with the slide 59 and by moving the lever back the slide 59 is moved and through its connections with the yoke 66 the annulus 22 is moved so as to advance the spur gear 27 into engagement with the internal gear 10. Owing to the fact that the spur gear 27 is in engagement with the square portion of the shaft 12 the spur gear 27 has been rotating at the same rate of speed as the fly wheel so that when said spur gear is thrown to engage the internal gear of said fly-wheel the connection between the gears takes place without any undue strain or the danger of mutilating or stripping the teeth of the gears.

What I claim is:

1. In an automobile fire engine, the combination of an engine, a shaft driven thereby, a fly-wheel on said shaft, a second shaft, a clutch member on said second shaft adapted to engage said fly-wheel, a slidable gear wheel on said shaft, a pump, a pump shaft, a gear on said pump shaft with which said first named gear is adapted to engage, slides, rock shafts, connections between said rock shafts and said clutch member and sliding gear, a lever, and connections between said lever and said slides, whereby the clutch member and sliding gear may be operated independently of each other.

2. In an automobile fire engine, the combination of an engine, a shaft driven thereby, a fly-wheel on said shaft, a second shaft, a sliding clutch member on said second shaft adapted to engage said fly-wheel, a sliding gear on said second shaft, a pump, a pump shaft, a gear on said pump shaft with which said sliding gear is adapted to engage, slides, connections between said slides and said sliding gear and said clutch member, a lever, and means operating said slides independently of each other by said lever.

3. In an automobile fire engine, the combination of an engine, a shaft driven thereby, a fly-wheel on said shaft, a second shaft, a slidable clutch member on said second shaft adapted to engage said fly-wheel, a sliding gear on said second shaft, a pump, a pump shaft, a gear on said pump shaft with which said sliding gear is adapted to engage, slides, connections between said

slides and said clutch member and slidable gear, a rotary longitudinally movable shaft, a lever connected thereto, an arm carried by said last named shaft, and adapted to be thrown into engagement with one of said slides at a time.

4. In an automobile fire engine, the combination of an engine, a shaft driven thereby, a fly-wheel on said shaft, a second shaft, a slidable clutch member on said second shaft adapted to engage said fly-wheel, a slidable gear on said second shaft, a pump, a pump shaft, a gear on said pump shaft with which said slidable gear is adapted to engage, slides, connections between said slides and said clutch member and sliding gear, a longitudinally movable and rotary shaft, a lever connected thereto, a U-shaped guide for said lever, an arm on said last named shaft adapted to be brought into engagement with one of said slides at a time.

5. In an automobile fire engine, the combination of an engine, a shaft driven thereby, a fly-wheel on said shaft, a second shaft, a slidable clutch member on said second shaft adapted to engage said fly-wheel, a sliding gear on said second shaft, a pump, a pump shaft, a gear on said pump shaft with which said sliding gear is adapted to engage, slides having grooves therein, connections between said slides and said clutch member and said sliding gear, a rotary and longitudinally movable shaft, a lever connected thereto, and an arm on said last named shaft adapted to enter the grooves in said slides.

6. In an automobile fire engine, the combination of an engine, a shaft driven thereby, a fly-wheel on said shaft, a second shaft, a slidable gear on said second shaft, a pump, a pump shaft, a gear on said pump shaft with which said slidable gear is adapted to engage, slides, connections between said slides and said clutch member and said sliding gear, a lever, connections between said lever and said slides to operate the same independently of each other, and means for locking said slides in place.

In testimony whereof, I the said JAMES M. SCHOONMAKER, Jr., have hereunto set my hand.

JAMES M. SCHOONMAKER, JR.

Witnesses:
D. M. McLEOD,
J. FRANCIS SULLIVAN.